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REPORT ON THE MARKET POSSIBILITIES OF FRACTIONALLY COAGULATED CREPE

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A PRELIMINARY INVESTIGATION OF THE

SECOND QUARTERLY CIRCULAR FOR 1930.

ERRATA.

SULPHUR DUSTING AS A MEANS OF CONTROLLING OIDIUM—
Following page 30.

Plates II and V should be interchanged. The legend: "Kandanuwara Estate. Dusting in progress—20-2-30" applies to the present Plate V, and the legend: "Kandanuwara Estate. Dusted field after four applications—11-3-30" applies to the present Plate II.

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MINUTES OF THE EIGHTH ORDINARY GENERAL MEETING OF THE RUBBER RESEARCH SCHEME (CEYLON)

REPORT ON THE MARKET POSSIBILITIES OF FRACTIONALLY COAGULATED CREPE

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THE demand for a pale sole crepe has led to the extensive use of processes of fractional coagulation in which the bulk of the colouring matter in the latex is removed with the first fraction, so that the second fraction is of a very light colour. The Chemist in Ceylon (Mr. T. E. H. O'Brien) suggests that estates having difficulty in preparing standard crepe with an appearance which satisfies the market, might find it profitable to adopt the fractional coagulation method as employed in factories producing sole crepe. Under the conditions specified for Ceylon[1] the first fraction amounts to about 10 per cent of the whole and is sold at nearly 1d. per lb. less than standard crepe on account of its dark colour.* The remaining 90 per cent is of such good appearance that it will undoubtedly obtain full market price.

According to de Vries[2] "Partial coagulation was systematically applied in former years on some estates" in Java. The method of coagulation was not identical with that proposed in Ceylon and the first fraction amounted to 20 to 25 per cent of the total rubber in the latex. The second fraction did not command a premium to compensate for the low market value of the first fraction and, according to de Vries, "the method proved unprofitable and is therefore seldom applied." It is possible however that the method may prove profitable on an estate which has difficulty in obtaining full market price for its first grade crepe, particularly if coagulation conditions are so arranged that the dark coloured first fraction does not amount to more than 10 per cent of the whole.

It was considered by Mr. O'Brien that it would be desirable to compare the properties of the first and second fraction rubber as regards vulcanisation, plasticity, etc., in order to determine whether the market grading of the rubber is in accordance with its intrinsic value, and for this purpose samples were forwarded to the Imperial Institute for examination.

* *Note.*—In a valuation given by a Colombo Broker, March 1929, it was stated that "Sample B (first fraction rubber) should sell at about 3¾ cents below standard quality price, on a reasonable market of the present value (45 cents)."—T.E.H.O'B.

The following is a report from a firm of London brokers to whom samples were submitted by the London Advisory Committee of the Scheme.

"As far as the London market is concerned, Samples Nos. 1458* and 1459* are of the same value; No. 1459 is of such white quality, however, that if it was sold here in bulk, it might in course of time command a slight premium over Standard Crepe, say $\frac{1}{8}$d. per lb.

No. 1460* is far below Standard and although the quality of the rubber may not be affected, it would not meet with a very good demand on the London market, except at a considerable discount."

The broker's report indicates that it will be difficult to obtain a premium for the pale second fraction and that even though the intrinsic qualities of the first and second fractions are the same, the dark coloured fraction will not command the same price as the light coloured fraction.

It was considered by the London Committee however that if it could be shown that either or both fractions were peculiarly suited for definite manufacturing purposes, it might be possible to interest manufacturers in this method of preparation and to create a special demand which should eventually be reflected in price. For example, the pale second fraction should be particularly suitable for the manufacture of transparent dipped goods such as teats, which have to satisfy a market equally as exacting as regards appearance as that for plantation rubber.

Two sets of first and second fraction crepes prepared by Mr. O'Brien in Ceylon have now been examined by the London Staff of the Scheme, and in view of the results obtained an important British manufacturer has agreed to try the first fraction for the manufacture of vulcanised tape and the second for transparent dipped goods. Arrangements have also been made with the Research Association of British Rubber Manufacturers and the Electrical Research Association for the inclusion of the second fraction rubber along with other types in an investigation which has as its object the preparation of ebonite with improved properties.

The samples examined were in the form of blanket crepe and consisted of a control sample and fractionally coagulated material. The control sample was prepared by coagulation in the usual way. The first fraction was prepared without the addition of acid by allowing the diluted latex containing bisulphite to stand overnight. At the end of this period it was stirred vigorously for an hour and the first clot removed and treated in the usual way. The remaining latex was treated with acid and the coagulum machined as usual.

* 1458—Control. 1460—1st Fraction, 1459—2nd Fraction.

On arrival in London the first fraction crepe was brownish-yellow, whilst the second fraction crepe was very light in colour, being slightly paler than the control sample. The dark colour of the first fraction is due to carotin[3] (the yellow colouring matter of carrots). It is removed on extraction with acetone, the extracted rubber being much paler than the original. The following results show that the first fraction contains a much larger proportion of substances soluble in acetone than the second, but it is not suggested that this is due to the different amounts of carotin in the two fractions as carotin only forms a small proportion of the substances soluble in acetone.[3]

De Vries[4] also stated that the first fraction rubber contains a higher percentage of nitrogen and mineral matter. These additional quantities of non-caoutchouc substances not only affect the colour of the first clot but also its vulcanising and ageing properties, as shown by the following results of tests:

	Acetone Extract	
	1st series per cent	2nd series per cent
Control sample	3·05	3·28
First fraction	5·36	7·08
Second fraction	2·80	3·04

(a) Vulcanisation Tests

Series	Sample No.	Description	Rubber-sulphur mixing.	Time of vulcanisation at 148°C.	Tensile Strength	Elongation		Maximum tensile strength	Time of vulcanisation required for	
						At load of 1·00 kgs./sq. mm.	At load of 1·04 kgs./sq.mm.		$E_{1·00}=800$ per cent	$E_{1·04}=775$ per cent
				(mins.)	(lb./sq. in.)	(per cent)	(per cent)	(lb./sq. in.)	(mins.)	(mins.)
First	1458	Control	100:10	120	1850	840	—	2220	131	—
				140	2220	771	—			
,,	1460	First fraction	,,	80	1880	850	—	2150	90	—
				100	2150	752	—			
,,	1459	Second fraction	,,	120	1880	685	—			
				120	2100	825	—	2340	126	—
				140	2340	746	—			
Second	1490	Control	90:10	100	1480	—	906			
				110	1980	—	837			
				120	2170	—	800			
				130	2150	—	775	2150	—	130
				140	2250	—	743			
				150	2370	—	705			
				160	940	—	681			
,,	1491	First fraction	,,	40	1350	—	—			
				50	1570	—	909			
				58	1930	—	840			
				70	2080	—	800	2260	—	76
				80	2260	—	758			
				90	2200	—	713			
				100	1800	—	692			
,,	1492	Second fraction	,,	100	1630	—	867			
				110	1970	—	823			
				120	2120	—	800			
				130	2140	—	763	2240	—	126
				140	2130	—	712			
				150	2240	—	686			
				160	1260	—	653			

The following points in connection with the above results are of interest:

1. The dark coloured first fraction vulcanises in a little over half the time of the control sample and of the second fraction.

2. The second fraction vulcanises slightly faster than the control but the difference is of no practical importance.

3. All three samples have good tensile strengths.

4. The first fraction maintains good tensile properties over a much wider range of "cures" than the other samples, regard being paid to the relative rates of vulcanisation. This test was performed on the second series of samples only. The results are shown in a comparable form in the following table:

Sample No.	Description	Range of cures for which strength exceeds 1,500 lb./100 x sq. in.
		Correct cure
1490	Control	39
1491	First fraction	> 66
1492	Second ,,	40

(*b*) *Ageing Tests.*—Vulcanised test rings were kept circulating in air at 70°C and removed after periods of 48, 96 and 144 hours. The following are the results of tests on the aged samples:

Series	Sample No.	Description	Time of vulcanisation	Period of artificial ageing	Tensile Strength	Elongation at load of 1·04 kgs./sq. mm.
			(mins.)	(hrs.)	(lb./sq. in.)	(per cent)
First	1458	Control	100	nil	1730	872
				48	2060	794
				96	1860	755
				144	1700	730
Second	1490	,,	110	nil	1760	850
				48	2280	766
				96	2060	719
				144	1780	690
First	1460	First fraction	60	nil	1450	878
				48	2170	804
				96	2280	791
				144	2010	770
Second	1491	,, ,,	58	nil	1930	840
				48	2480	742
				96	2490	693
				144	2240	669
First	1459	Second fraction	98	nil	1580	866
				48	2260	794
				96	2020	754
				144	1800	731
Second	1492	,, ,,	100	nil	1760	864
				48	2420	772
				96	2260	719
				144	950	695

There is little difference between the ageing properties of the second fraction and of the control sample. The ageing properties of the first fraction are superior because it retains its tensile strength for a longer period.

(*c*) *Plasticity Tests.*—The results of plasticity tests are shown in the following table:

Series	Sample No.	Description	Unmasticated rubber D_{30}	Mastication number
First	1458	Control	154	99
,,	1460	First fraction	161	101
,,	1459	Second fraction	154	95
Second	1490	Control	161	92
,,	1491	First fraction	156	90
,,	1492	Second fraction	156	89

There is little difference in the plasticity of the three samples. This is somewhat surprising as the first fraction contains more non-rubber accessory substances than the others and the freshly rolled crepe before drying was very weak, displaying poor coherence.

REMARKS

The first fraction crepe might be regarded as inferior to the others not only on account of colour but also because it represents a less pure form of caoutchouc. The additional accessory substances however not only enable the rubber to vulcanise quickly but also to maintain a good tensile strength over a wide range of cures and for a long ageing period. These properties may be of value in connection with the manufacture of tape.[5]

There is little difference between the second fraction and the control sample except in colour. Pale raw rubber should be of value for the manufacture of transparent goods.

An attempt is being made to interest manufacturers in the pale rubber and also in the highly coloured first fraction.

REFERENCES

1. T. E. H. O'Brien.—"Guide to the preparation of plantation rubber in Ceylon," p. 36.
2. Estate Rubber, 1920, p. 389.
3. Eaton and Fullerton,—*Rubber Research Institute of Malaya Quarterly Circular* 1, 3, p. 135.
4. Estate Rubber, p. 390.
5. Twiss and Jones.—J.S.C.I. *42*, 1923, p. 505T.

A PRELIMINARY INVESTIGATION OF THE EFFECT OF DIFFERENT CONDITIONS OF STORAGE ON THE HARDNESS OF RAW RUBBER

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ONE of the factors affecting the reliability of plantation rubber is its variability in plasticity. Some consignments require more milling than others to reduce them to the plasticity required for manufacturing operations. If first grade rubber were uniform in this respect it would tend to increase the demand for this quality of material at the expense of more variable types (Special Circular March, 1930: "Value to Rubber Growers of the Work in London of the Ceylon Rubber Research Scheme.")

De Vries (Trans. Inst. Rubber Industry 1927, 3, 284) has shown that there is little variation in the hardness of first grade rubber soon after preparation, but that differences arise subsequently due to changes in the rubber during the period between its preparation and use by the manufacturer, specimens sometimes becoming harder, sometimes softer and sometimes showing little change. He concludes that the change is on the whole dependent upon the serum substances in the rubber, and that an excess causes hardening and a deficiency softening. The relation between the hardness of unmasticated or unmilled rubber and the amount of mastication required is not fully known, but information on this point is being obtained in London by the staff of the Ceylon Rubber Research Scheme.

Temperature.—The samples examined in London in connection with the work of the Ceylon Rubber Research Scheme on the effect of methods of preparation on plasticity are always stored for 6 months at 60°F after their arrival in London, so that changes have ample time to develop and the differences between samples correspond with those occurring in commercial operations. As rubber on its journey from the East and while in Europe and America is subjected to a wide variety of temperature conditions, most of the samples received for examination have lately been stored at 32°F as well as at 60°F before testing. The samples stored at 32°F are invariably "frozen," (*i.e.*, they

become opaque and very hard) and some of those stored at 60°F also become "frozen," but on warming or masticating they all quickly become translucent and supple, and their "frozen" condition appears to have no effect on the results of either mastication or hardness tests. On the whole the samples stored at 32°F are slightly softer and require slightly less milling to reach a fixed degree of plasticity than those stored at 60°F.

It is proposed to extend the investigation to the effect of storage at higher temperatures as, in practice, rubber is subjected for a time to tropical temperatures and may also be exposed to very high temperatures during transport and whilst in Europe and America.

Humidity.—Not only is the rubber of commerce exposed to a variety of temperatures but also to a wide range of humidity conditions. In the tropics the atmosphere is mostly damp; in Europe and America the amount of moisture in the atmosphere is much less but is subject to considerable fluctuations. A preliminary series of experiments was therefore arranged to determine the effect on hardness of storing rubber at 60°F for a considerable period in atmospheres containing different amounts of miosture.

The samples were stored for 11 months in glass jars and exposed to air at 60°F containing different amounts of moisture as follows:—(a) dry, (b) 38 per cent saturation, (b) 80 per cent saturation, (c) 96 per cent saturation. All the jars were kept in a moderately dark room, but as they were exposed to a dull light which might have some effect on hardness an additional set of samples was stored in a jar containing air 80 per cent saturated with moisture, and totally enclosed so as to exclude all light.

The different amounts of moisture in the atmosphere required for these experiments were obtained by sulphuric acid of the required concentration. As sulphuric acid vapour might have an effect on the hardness of the rubber a further set of samples was stored over calcium chloride for comparison with that stored over concentrated sulphuric acid.

The samples consisted of ten smoked sheets which had been prepared by allowing the coagulum to remain in the serum for different periods. They were all prepared from the same latex but in the case of five of them the coagulant was acetic acid and paranitrophenol, and in the case of the other five acetic acid only was used for coagulation. The test was only regarded as a preliminary one to indicate whether the subject was worthy of detailed attention and there was no particular reason for selecting these samples beyond that of convenience.

The results are shown in the tables appended to this report; the higher the results (D_{30}) the harder is the rubber. The hardness figure for most samples of first grade rubber is between 140 and 200.

As the length of time the coagulum remained in the serum seems to have had no effect on the results of hardness tests, it is convenient to compare the average results for each set of five samples, which are shown in the following tables:

EFFECT OF STORAGE FOR 11 MONTHS AT 60°F.

(a) Different conditions of moisture

Samples	Before Storage	After Storage				
		Dry		38 per cent moisture 50 per cent sulphuric acid	80 per cent moisture 25 per cent sulphuric acid	96 per cent moisture 10 per cent sulphuric acid
		Concentrated sulphuric acid	Calcium chloride			
	D_{30}	D_{30}	D_{30}	D_{30}	D_{30}	D_{30}
	mms./100	mms./100	mms./100	mms./100	mms./100	mms./100
Not containing paranitrophenol	157	181	177	167	159	174
Containing paranitrophenol	155	187	178	168	158	168

(b) Different conditions of light (humidity 80 per cent saturation)

Samples	*Before Storage*	*After Storage*	
		Diffused light	Dark
	D_{30}	D_{30}	D_{30}
	mms./100	mms./100	mms./100
Not containing paranitrophenol	157	159	161
Containing paranitrophenol	155	158	161

On an average all the samples became harder on keeping. Those stored in a dry atmosphere (over concentrated sulphuric acid or calcium chloride) became very hard, and the wetter the atmosphere the less the change in hardness except in the case of those samples stored in a very wet atmosphere. Some of these were as hard as samples stored in a dry atmosphere, but as they had become mouldy and the hardness was proportional to the

amount of mould present it is concluded that the hardness of these samples was due to secondary changes. The samples containing paranitrophenol did not become as mouldy as the others, and it will be observed that they are much softer although on the whole, in other cases, paranitrophenol had little effect on the hardness of the rubber.

Prolonged exposure to very dull diffused light had no effect on the hardness of sheet under the moisture conditions selected.

It is evident from these preliminary experiments that changes in the hardness of rubber on keeping are markedly affected by the amount of moisture in the atmosphere. It is proposed therefore to carry out more detailed work and also to study further the effect of mould on plasticity.

Oxygen.—As a matter of theoretical interest duplicate portions of the same samples were stored at 60°F in sealed tins in oxygen and nitrogen without any control of the humidity. Only the samples stored in nitrogen failed to harden. Further tests are necessary before it can be concluded that changes in hardness on keeping do not occur in the absence of oxygen. The results obtained are shown below.

Samples	Before Storage	After Storage	
		Oxygen	Nitrogen
	D_{30} mms./100	D_{30} mms./100	D_{30} mms./100
Not containing paranitrophenol (average)	157	168	153
Containing paranitrophenol (average)	155	162	153

Table A

After storage for 11 months

Sample No.	Coagulant	Period Coagulum left in serum	Before storage	Concentrated sulphuric acid (dry)	Calcium Chloride (dry)	50 per cent sulphuric acid (38 per cent solution)	25 per cent sulphuric acid (80 per cent saturation) dark	light	10 per cent sulphuric acid (96 per cent saturation)	Oxygen	Nitrogen
		(hrs.)	D_{30}	D_{30}	D_{30}	D_{30}	D_{30}	D_{30}	D_{30}	D_{30}	D_{30}
			mms./100	mms./100	mms./100	mms./100	mms./100	mms./100	mms./100	mms./100	mms./100
1385	Acetic Acid	4½	154	177	168	158	155	161	174	165	147
1386	,, ,,	17¾	158	180	170	169	160	158	169	163	157
1387	,, ,,	35½	156	182	180	169	160	160	176	174	154
1388	,, ,,	40¼	156	183	178	168	163	155	182	167	153
1389	,, ,,	55½	159	182	187	169	165	160	171	169	155
1390	Acetic acid and paranitrophenol	4½	151	190	178	169	164	161	163	167	153
1391	,, ,,	17¾	158	184	183	161	161	160	160	164	152
1392	,, ,,	35½	155	174	171	166	156	155	165	160	148
1393	,, ,,	40¼	156	194	189	161	160	156	168	157	155
1394	,, ,,	55½	155	192	171	159	164	160	157	161	159

SULPHUR DUSTING AS A MEANS OF CONTROLLING OIDIUM*

A STATEMENT MADE AT THE GENERAL MEETING OF THE RUBBER RESEARCH SCHEME ON APRIL 25, 1930

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Introduction.—The experiments which the Rubber Research Scheme is carrying out on the control of *Oidium* leaf disease by means of sulphur dusting have not yet reached a stage at which a detailed report may be issued. In view, however, of the interest in the method which planters and agents are now showing, as evidenced by a number of enquiries received during the last few weeks, it was thought that a statement made at this meeting would be of value. The following is therefore in the nature of a brief interim report, summarising the method of procedure and the results so far achieved. It may at once be stated that although we have not secured the 100% degree of control claimed for the treatment in Java, the experiments which have so far been carried out give promise that the method will prove to be an effective and economical means of control in Ceylon.

The photographs attached illustrate the dusting process and the results achieved, and are readily understood by reference to the explanatory footnotes.

MATERIALS

(a) *Dusting Machine.*—In the experiments referred to a machine imported from Java has been used. It is hoped to carry out a comparative test with a machine of British manufacture at an early date, and until the results of this trial are available no official recommendation as regards the most suitable machine can be made.

In the Dutch machine a small petrol motor drives a fan at high speed. The sulphur is fed into the fan chamber from a hopper with a feed regulator, and is blown up through a chimney. The whole forms a compact unit easily portable by coolies.

(b) *Sulphur.*—The sulphur that has been used is Kawah Poetih volcanic sulphur from Java. This is sold in two grades of which the higher grade, known as "Flotate" sulphur, has been used. This dust contains 90-95% sulphur (on dry

* Issued as Leaflet No. 11 of the Rubber Research Scheme (Ceylon).

sample) with a maximum moisture content of 5%. It is necessary to dry this sulphur before use by spreading it out in the sun for a few hours. The sulphur is very finely divided and has excellent cloud-forming properties. It is obtainable from N. V. The Estates Supplies Co., Ltd., Sourabaya, Java, at a cost of F 100/- per 1000 Kg. (About -/06 cts. per lb. in Ceylon).

The Dusting Operation.—Sulphur is fed into the hopper, the machine is swung with the starting belt, and the dusting is in progress. The machine is carried, while working, along suitable paths or lines, the output of sulphur being adjusted according to the strength of the wind, the slope of the land, and the rate of progress. It is usually possible to do most of the dusting from paths or roads. A gang of ten or twelve coolies is sufficient according to the nature of the ground; four coolies to carry the machine, one to keep the hopper constantly half-full of sulphur, and the remainder to bring the sulphur to the machine from pre-arranged dumps.

The distance to which the sulphur carries, and therefore the working range of the machine, depends largely on the strength of the wind. With no wind the sulphur rises very high in the air and the process is very slow. A strong wind is unfavourable unless blowing down a steep slope since the sulphur does not then rise satisfactorily to the tops of the trees. The ideal conditions are a very slight steady breeze which permits the sulphur to rise to a sufficient height, and at the same time wafts it slowly through the foliage. Under these conditions the machine has an effective range of action of about 100 yards. Under Ceylon conditions an average area of 100 acres should be covered in a day.

The Experiments in Matale.—Experiments on sulphur dusting have been carried out on Bandarapola and Kandanuwara estates, Matale, the rubber being very severely affected with *Oidium*. On the experimental 100 acres on Bandarapola three applications of sulphur were made, while on Kandanuwara a field of 30 acres was treated with five dustings. The results secured on Bandarapola were disappointing, and indicate that insufficient applications were made. Attention is drawn to the experiments on Kandanuwara.

On the experimental area five applications of sulphur were made at approximately 10-14 day intervals during the period of refoliation after wintering. A total quantity of 1,600 lb. of sulphur was used which averages approximately $10\frac{1}{3}$ lb. per acre per application. A neighbouring field of equally affected rubber served as a control.

Owing to a number of causes which need not be discussed here 100% control of *Oidium* on the dusted area has not been

secured. The photographs, however, indicate that the foliage of the dusted rubber is markedly superior to that of the undusted control area.

As an additional means of judging the results of the dusting the foliage of a number of individual trees in small plots scattered throughout the dusted and control fields was classified according to the intensity of *Oidium* attack. 156 trees were so examined in the dusted field, and 150 trees in the control field, the examination being made in April after the wintering was completed. In the dusted field 11% of the trees were classed as completely defoliated, while in the control area the figure was 53%. Correspondingly 20% were almost free from the disease in the dusted as against 3% in the undusted area.

Yield records are being taken in the dusted and undusted fields but no results are yet available.

Quantities and Costs.—The cost of the dusting on the 30 acres of Kandanuwara estate was high owing to the smallness of the area and the disproportionate cost per acre of the labour. The following is a sample of the cost of one day's dusting on the basis of 100 acres per day:

		Rs.	cts.
1,200 lb. sulphur @ -/06 cts. per lb.	...	72	00
4 coolies to carry duster @ -/60 cts.	...	2	40
6 coolies carrying and feeding sulphur	...	3	60
1½ gallons petrol-oil mixture	...	3	00
		81	00

On this basis the cost works out at -/81 cents per acre per application, excluding depreciation on the machine and special supervision. It will be seen that the cost lies almost entirely in the sulphur, the labour and the running expenses of the machine being very small items.

Discussion.—Such questions as the minimum effective quantity of sulphur per acre, the number of applications necessary and the period elapsing between successive applications must be subjects for further investigation, and will depend largely on the degree of attack. It is also not known whether dusting will be a permanent cure or whether it will be necessary to carry out the treatment every year. The method has the advantage of being quick and comparatively cheap, and it is hoped that further dustings may achieve a higher degree of control than the first experiments.

Acknowledgment.—In conclusion, I should like to express my gratitude to the superintendents of Bandarapola and Kandanuwara estates whose assistance has been of great value.

Plate I.—The Dusting Machine—12-3-20.

Plate II.—Kandanuwara Estate. Dusting in progress—20-2-30.

Plate III.—Kandanuwara Estate. Dusting in progress with machine in motion—22-1-30.

Plate IV.—Kandanuwara Estate,
Dusting in progress. Machine at rest —12-3-30.

Plate V.—Kandanuwara Estate. Dusted field after four applications—11-3-30.

Plate VI.—Kandanuwara Estate. Undusted control field—11-3-30.

Plate VII.—Kandanuwara Estate. Dusted field after four applications—11-3-30.

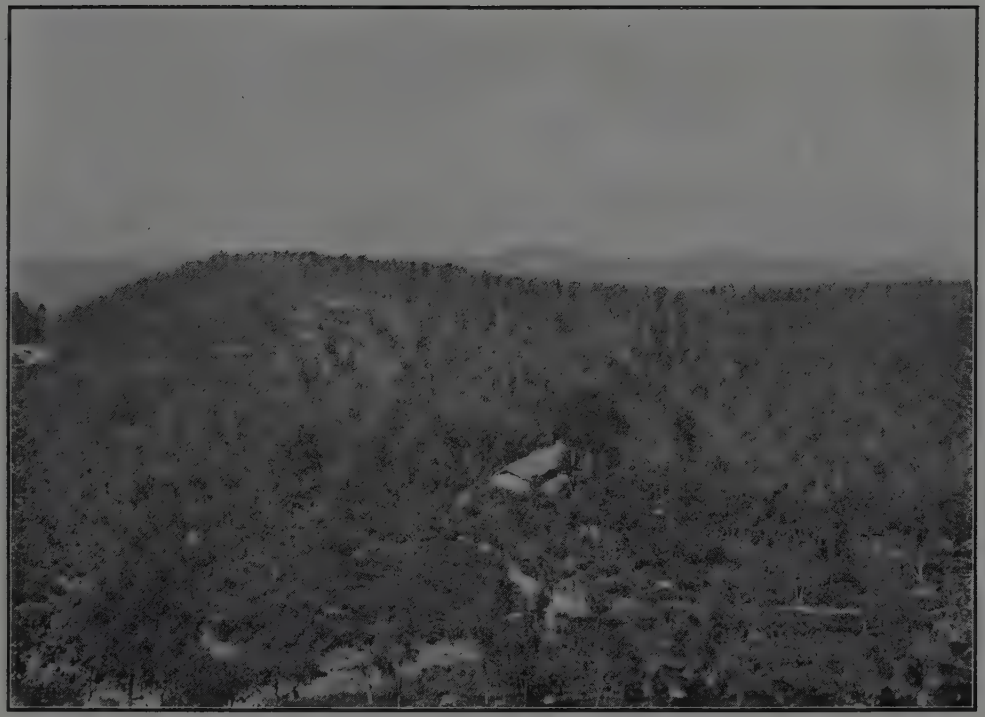

Plate VIII.—Kandanuwara Estate. Undusted control field—11-3-30.

MINUTES OF THE EIGHTH ORDINARY GENERAL MEETING OF THE RUBBER RESEARCH SCHEME (CEYLON)

THE eighth Ordinary General Meeting of the Rubber Research Scheme (Ceylon) was held in the old Legislative Council Chamber, Colombo, at 11 a.m. on the 25th of April, 1930.

Dr. W. Youngman, Director of Agriculture and Chairman of the Executive Committee of the Scheme, occupied the chair.

1. REPORT OF THE EXECUTIVE COMMITTEE

Moving the adoption of the reports, accounts and balance sheet for 1929, Dr. Youngman said:

It is my pleasure to present to you the eighth annual report of the Executive Committee of the Rubber Research Scheme (Ceylon) for the year ending December 31, 1929. The membership of the Scheme, as you will see in the report, has diminished by six, there having been a loss of 9 subscribers and an accession of 3. Whilst we should like to see the membership increase rather than diminish, it is significant that the subscriptions have increased due to an expansion in the yield of rubber.

The accounts and balance sheet for the year are submitted along with the report, and we shall ask you to pass them, they having been duly certified by your auditors.

You will observe that this is the first year in which our expenditure has exceeded the income, the result of the growth of the Scheme, for our revenue has not diminished. This state of affairs is bound to be until we can get the Scheme put on a more permanent basis by the passing of the Rubber Research Scheme Ordinance. The draft Ordinance is still under consideration by a Select Committee of the Legislative Council.

Although the Scheme seems to be working as well as could be expected under present arrangements, pending its establishment on a permanent basis by the passing of an Ordinance, the appointment of a Director seems much to be desired.

Many of the functions of a Director were discharged by your Organising Secretary, Mr. Mitchell, who left at the end of September, 1929, after having discharged these duties for eight and half years. I am sure you will acquiesce in the appreciation of his work recorded by your Executive Committee. For the time being, your Chemist, Mr. T. E. H. O'Brien, is acting as Chief Technical Officer, co-ordinating the scientific staff generally and conducting the technical correspondence of the Scheme.

You will note that much attention has been given by your Technical Committee to the subjects of budgrafting and selection and that they formed a small Sub-Committee to deal with these important points.

Speaking personally as one with a slight acquaintance with the botany of crop plants, I feel sure that this is a very wise step and one from which much help to the industry can be hoped for. I have had occasion myself recently to devote attention to what is known as the vegetative reproduction of plants, that is the increase of plants by methods other than from seed,

and I have been astonished at the great gaps that exist in our knowledge of this important subject amongst plants generally. Of precise, exact knowledge of the influence of stock upon scion and of bud variation we have but little. We are at the present time at Peradeniya faced with a similar problem with regard to oranges and grapefruit. Although there is a far cry from these fruit trees to rubber yet the problem is the same and their example may serve to focus in your minds what it is. On the same orange tree there can at times be found two or more branches differing from one another considerably in certain visible characters such as the shape and form of their leaf and perhaps of their fruit. Budwood thus taken from such a tree would certainly propagate two or more kinds of tree. Now these characters are an outward and visible sign but we are perfectly justified in holding that there are other characters in plants that may not be outward and visible but that differ from branch to branch. Such a character would seem to be the latex secreting capacity of buds (which are incipient branches) in the rubber tree. Thus we are faced with the fact that until it is proved to be the case we are not justified in assuming that all the buds capable of producing new rubber trees will transmit the high or low latex yielding character of their parent. This problem presents many interesting side lines capable of being of great economic importance that require and will repay fuller investigation. One of the first things to be done is to obtain records of parent trees and then to see how and to what extent they transmit their characters to their buds. Work along these lines is in hand.

Of considerable interest in the report is Mr. Mitchell's account of the general condition of Ceylon rubber estates in which he summarises the chief diseases found of root, stem and leaf of the rubber tree and discusses some of the problems of rubber growing in general.

Your Chemist gives some account of his work on the curing of sheet rubber, comparing the effect of drying in hot air with and without smoke, also on the effect of iron in the water used for diluting latex upon the crepe, as well as other work on mould prevention, fractional coagulation and latex adulteration.

The Physiological Botanist describes much work of a field nature that had to be undertaken in connection with the Nivitigalkele Experiment Station and has published notes on Brown Bast, the Re-planting of old rubber and Budding of rubber and its meaning for Ceylon, amongst other things.

The Mycologist has devoted a great deal of attention to the *Oidium* leaf disease. In connection with this he has made some interesting experiments with Sulphur spraying as a preventative and he will show us some photographs today and tell us about them in connection with this work as I thought the Committee would like to see them. Other useful work on diseases of Bud Shoots, Bark Rot and other troubles is described.

I think you will agree with me that the report shows a year of progressive work and that we are only waiting for the Rubber Research Scheme Ordinance to help us to progress further still.

One other point should be mentioned and that is the coming departure from amongst us of Dr. Small who until recently acted as your Chairman I am sure you will agree when I say that this Committee is indebted to him for the able and careful way in which he conducted its affairs during the period of his stewardship.

I have the pleasure to move the adoption of the report and accounts for the year 1929.

The motion was seconded by Mr. J. D. Hoare and was carried unanimously.

2. REPORTS OF THE TECHNICAL OFFICERS

The Chairman suggested in connection with the reports of the technical officers of the Scheme, that it would be suitable for Mr. Murray, the Mycologist, to present photographs and details of sulphur dusting carried out by him as a means of controlling Oidium. A dusting machine obtained from Java had been employed, but a British machine was expected and would be tried shortly. Mr. Murray read a preliminary report of his investigations on sulphur dusting as a means of controlling Oidium, which is printed separately at pages 28 to 30 and which has been issued as Leaflet No. 11 of the Rubber Research Scheme (Ceylon).

Mr. Collett moved a vote of thanks to Mr. Murray for his interesting report and enquired whether the Java sulphur was quite satisfactory. Mr. Murray replied that he had nothing to say against Java sulphur, but he was hoping to use American sulphur shortly in Uva. The American sulphur had the advantage of being specially prepared and does not need drying or sifting and is comparatively free from acid. The American sulphur costs roughly from 30 to 50 per cent. more than the Java sulphur. There was little difference between the two in the fineness of the powder. Replying to further questions from Mr. Wilmot A. Perera and Mr. O'Brien, Mr. Murray stated that the Dutch machine was manufactured in Java, and that it would be feasible to dust low-lying rubber from hillsides.

3. REPORT OF THE LONDON ADVISORY COMMITTEE

The report of the London Advisory Committee was accepted without comments.

4. AUDITORS

The Chairman proposed and Mr. Davidson seconded, that Messrs. Duncum, Watkins, Ford & Co. be re-appointed Auditors for 1930, on the same remuneration as for 1929, viz., Rs. 500. This was approved unanimously.

5. CONCLUSION

Mr. Collett then proposed a hearty vote of thanks to Dr. Youngman for his chairmanship and his able speech in proposing the adoption of the report. He took the opportunity to extend a cordial welcome to Dr. Youngman upon his assuming duties as Director of Agriculture and to second the appreciation expressed by him of the work of Dr. Small who had acted as Chairman for 15 months.

Dr. Youngman, returning thanks, said it gave him great pleasure to preside at these meetings and hoped the pleasure would be mutual for some time to come.

The meeting then concluded.

J. I. GNANAMUTTU,
Secretary,
Rubber Research Scheme,
(Ceylon).

Peradeniya,
May 10, 1930.

NOTICES.

SUBSCRIPTIONS.

Arrangements have now been made for Bulletins and Circulars of the Ceylon Rubber Research Scheme to be made available to non-contributors to the Scheme at the rate of Rs. 15·00 per annum, post free.

GLASS HYDROMETERS.

Glass hydrometers for testing latex and for testing formic acid as specified and as recommended by the Rubber Research Scheme (Ceylon) may be obtained at a cost of Rs. 12·50 and Rs. 10·50 each respectively, from :—

Messrs. WALKER, SONS & Co., Ltd.,
Engineering & Estate Supplies Department,
Colombo.